

SEQUENCE LISTING

<110> DeJong Dr., Jeff

<120> Transcription Factors Related to TFIIA

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<170> PatentIn Ver. 2.0

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cca caa ttg aat cca tgg tct ctt caa gca act act gaa aaa tca cag 579

Pro Gln Leu Asn Pro Trp Ser Leu Gln Ala Thr Thr Glu Lys Ser Gln

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aga att gaa acc gtg cta cag caa ccc gca att cta cct tct ggg cca 627

Arg Ile Glu Thr Val Leu Gln Gln Pro Ala Ile Leu Pro Ser Gly Pro

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gta gat agg aaa cac tta gaa aat gcc acc agt gat ata ctt gta tct 675

Val Asp Arg Lys His Leu Glu Asn Ala Thr Ser Asp Ile Leu Val Ser

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cct gga aat gag cat aaa atc gtg cct gaa gct ttg ttg tgt cat cag 723

Pro Gly Asn Glu His Lys Ile Val Pro Glu Ala Leu Leu Cys His Gln

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gaa agt tct cac tat atc agt ctt cca ggt gtt gta ttt tct cca cag 771

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gtc tct caa aca aat tct gat gtg gag tca gtg ctc agt ggt tca gct 819

Val Ser Gln Thr Asn Ser Asp Val Glu Ser Val Leu Ser Gly Ser Ala

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agc atg gct caa aat ctg cat gat gag tcc ctc tcc aca agc cct cat 867

Ser Met Ala Gln Asn Leu His Asp Glu Ser Leu Ser Thr Ser Pro His

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ggg gct ctc cac cag cac gtg act gat att cag ctt cat att ctt aaa 915

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Asn Arg Met Tyr Gly Cys Asp Ser Val Lys Gln Pro Arg Asn Ile Glu

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Glu Pro Ser Asn Ile Pro Val Ser Glu Lys Asp Ser Asn Ser Gln Val

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gat tta agc att cgg gtt act gat gat gat att ggt gaa ata att caa 1059

Asp Leu Ser Ile Arg Val Thr Asp Asp Asp Ile Gly Glu Ile Ile Gln

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Val Asp Gly Ser Gly Asp Thr Ser Ser Asn Glu Glu Ile Gly Ser Thr

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Arg Asp Ala Asp Glu Asn Glu Phe Leu Gly Asn Ile Asp Gly Gly Asp

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ctg aag gta cct gaa gaa gaa gct gac agt att tca aat gag gat tca 1203

Leu Lys Val Pro Glu Glu Glu Ala Asp Ser Ile Ser Asn Glu Asp Ser

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gcc aca aac agt agt gat aat gaa gac cct caa gta aac att gta gaa 1251

Ala Thr Asn Ser Ser Asp Asn Glu Asp Pro Gln Val Asn Ile Val Glu

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Asp Leu Ile Asp Thr Asp Asn Val Val Val Val Val Val Val Val Val Val

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 His Arg Ser Lys Asn Lys Trp Lys Phe Tyr Leu Lys Asp Gly Val Met
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tgt ttt gga ggg aga gac tat gta ttt gca aaa gcc att ggt gat gca 1443
 Cys Phe Gly Gly Arg Asp Tyr Val Phe Ala Lys Ala Ile Gly Asp Ala
 465 470 475

gag tgg taaaccttgt gagctcagta catctatctt gtgaacatca gttggactat 1499
 Glu Trp

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445 450 455 460
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Leu Phe Thr Leu Gln Leu Pro His Ser Leu His Gln Thr Leu Gln Ser
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Ser Thr Ala Ser Leu Val Ile Pro Ala Gly Arg Thr Leu Pro Ser Phe
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Thr Thr Ala Glu Leu Gly Thr Ser Asn Ser Ser Ala Asn Phe Thr Phe
100 105 110

Pro Gly Tyr Pro Ile His Val Pro Ala Gly Val Thr Leu Gln Thr Val
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Ser Gly His Leu Tyr Lys Val Asn Val Pro Ile Met Val Thr Glu Thr
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Ser Gly Arg Ala Gly Ile Leu Gln His Pro Ile Gln Gln Val Phe Gln
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Gln Leu Gly Gln Pro Ser Val Ile Gln Thr Ser Val Pro Gln Leu Asn
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Pro Trp Ser Leu Gln Ala Thr Thr Glu Lys Ser Gln Arg Ile Glu Thr
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Val Leu Gln Gln Pro Ala Ile Leu Pro Ser Gly Pro Val Asp Arg Lys
195 200 205

His Leu Glu Asn Ala Thr Ser Asp Ile Leu Val Ser Pro Gly Asn Glu
210 215 220

Tyr Ile Ser Leu Pro Gly Val Val Phe Ser Pro Gln Val Ser Gln Thr

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Asn Ser Asp Val Glu Ser Val Leu Ser Gly Ser Ala Ser Met Ala Gln

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270

Asn Leu His Asp Glu Ser Leu Ser Thr Ser Pro His Gly Ala Leu His

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285

Gln His Val Thr Asp Ile Gln Leu His Ile Leu Lys Asn Arg Met Tyr

290

295

300

Gly Cys Asp Ser Val Lys Gln Pro Arg Asn Ile Glu Glu Pro Ser Asn

305

310

315

320

Ile Pro Val Ser Glu Lys Asp Ser Asn Ser Gln Val Asp Leu Ser Ile

325

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Arg Val Thr Asp Asp Asp Ile Gly Glu Ile Ile Gln Val Asp Gly Ser

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Gly Asp Thr Ser Ser Asn Glu Glu Ile Gly Ser Thr Arg Asp Ala Asp

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Glu Asn Glu Phe Leu Gly Asn Ile Asp Gly Gly Asp Leu Lys Val Pro

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Glu Glu Glu Ala Asp Ser Ile Ser Asn Glu Asp Ser Ala Thr Asn Ser

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Asn Ser Gly Asp Asp Val Ser Glu Gln Asp Val Pro Asp Leu Phe Asp

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Thr Asp Asn Val Ile Val Cys Gln Tyr Asp Lys Ile His Arg Ser Lys

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Cys Ser Thr Asn Pro Gly Lys Trp Val Thr Phe Asp Asp Asp Pro Ala

Val Gln Ser Ser Gln Lys Ser Lys Asn Phe Pro Leu Glu Asn Gln Gly

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gtc tgt aga cca aat gga ctg aag ctg aac cct cct ggc ctc agg gaa 261

Val Cys Arg Pro Asn Gly Leu Lys Leu Asn Pro Pro Gly Leu Arg Glu

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ttt ccc agt gga tct tcc tcc acc agc agc act cct ctc tcc tcc ccc 309

Phe Pro Ser Gly Ser Ser Ser Thr Ser Ser Thr Pro Leu Ser Ser Pro

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Ile Val Asp Phe Tyr Phe Ser Pro Gly Pro Pro Ser Asn Ser Pro Leu

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tct aca cct acc aaa gac ttc cca ggt ttt cct ggc atc ccc aaa gca 405

Ser Thr Pro Thr Lys Asp Phe Pro Gly Phe Pro Gly Ile Pro Lys Ala

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ggg act cat gtg ctt tat cct att cca gaa tca tct tca gac agc cca 453

Gly Thr His Val Leu Tyr Pro Ile Pro Glu Ser Ser Ser Asp Ser Pro

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ctc gca ata tca gga gga gaa tct tcc tta ctg cct acc aga cca aca 501

Leu Ala Ile Ser Gly Gly Glu Ser Ser Leu Leu Pro Thr Arg Pro Thr

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tgt tta tcc cat gcc ttg tta ccc agt gac cac tca tgt aca cat cca 549

Cys Leu Ser His Ala Leu Leu Pro Ser Asp His Ser Cys Thr His Pro

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Ser Leu Gly Phe Gln Ser Asp Asp Leu Pro Gln Phe Gln Tyr Phe Arg

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Glu Asp Cys Ala Phe Ser Ser Pro Phe Arg Lys Asp Glu Gly Ser Asp

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tcc cat ttc acc ctt gac cca cca gga agc aaa aag atg ttc tca tca 741

Ser His Phe Thr Leu Asp Pro Pro Gly Ser Lys Lys Met Phe Ser Ser

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Arg Asn Lys Glu Met Pro Ile Asp Gln Lys Ser Leu Asn Lys Cys Ser

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ctc aac tat atc tgt gag aag ctt gaa cat ctc cag tca gct gag aac 837

Leu Asn Tyr Ile Cys Glu Lys Leu Glu His Leu Gln Ser Ala Glu Asn

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caa gac tca ctt aga agt ttg tct atg cac tgt cta tgt gct gaa gaa 885

Gln Asp Ser Leu Arg Ser Leu Ser Met His Cys Leu Cys Ala Glu Glu

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aat gcc tct tcc ttt gtc ccc cac aca ctc ttc agg agt cag cca aaa 933

Asn Ala Ser Ser Phe Val Pro His Thr Leu Phe Arg Ser Gln Pro Lys

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tcc gga tgg tct ttc atg ctg aga att cct gag aag aag aat atg atg 981

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Ser Ser Arg Gln Trp Gly Pro Ile Phe Leu Lys Val Leu Pro Gly Gly

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Ile Gln Leu Asp Pro Tyr Cys Arg Leu Ser Glu Pro Lys Val Glu Asn

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ttc agt gta gca gga aaa atc cac act gtg aag att gaa cat gtg tct 1173

Phe Ser Val Ala Gly Lys Ile His Thr Val Lys Ile Glu His Val Ser

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Tyr Thr Glu Lys Arg Lys Tyr His Ser Lys Thr Glu Val Val His Glu

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Ala Val Ser Lys Pro Lys Lys Asn Tyr Glu Glu Gln Glu Ile Ser Leu

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Val Glu Ser Ala Val Ile Thr Gln Ile Tyr Cys Leu Cys Phe Val Asn

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ggg aac ctg gaa tgc ttt tta acc ttg aat gac ctt gag ttg ccg aag 1509

Gly Asn Leu Glu Cys Phe Leu Thr Leu Asn Asp Leu Glu Leu Pro Lys

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Arg Asp Glu Ser Tyr Tyr Glu Lys Asp Ser Glu Lys Lys Gly Ile Asp

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Ile Leu Asp Tyr His Phe His Lys Cys Val Asn Val Gln Glu Phe Glu

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Leu Met Arg Phe Lys Thr Leu Tyr Asn Gly Asp Asn Leu Pro Phe Ser

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Leu Lys Ser Val Val Val Val Gln Gly Ala Tyr Val Glu Leu Gln Ala

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Glu Ser Glu Pro Val Ile Gln Val Thr Val Gly Ser Ala Lys Tyr Glu

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aat tca agt cta gat cat ccc cat tgt ctg tca tac aaa tta gag ctt 2085

Asn Ser Ser Leu Asp His Pro His Cys Leu Ser Tyr Lys Leu Glu Leu

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gga tca gac caa gaa att ccc tct gat tgg tat cca ttt gct act gtt 2133

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cag ttt tcc gtg cct gac acc tgt gcc tca agg aca gag gtc agg tct 2181

Gln Phe Ser Val Pro Asp Thr Cys Ala Ser Arg Thr Glu Val Arg Ser

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gta att gaa gga gtt cgg aat cta ttt gct gaa gaa ggt ata gag gaa 2325

Val Ile Glu Gly Val Arg Asn Leu Phe Ala Glu Glu Gly Ile Glu Glu

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caa gtt tta aaa gac ttg aag cag ctc tgg gaa acc aag gtt ttg cag 2373

Gln Val Leu Lys Asp Leu Lys Gln Leu Trp Glu Thr Lys Val Leu Gln

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Phe Thr Leu Gln Leu Pro His Ser Leu His Gln Thr Leu Gln Ser Ser

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Gly His Leu Tyr Lys Val Asn Val Pro Ile Met Val Thr Glu Thr Ser

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Gly Arg Ala Gly Ile Leu Gln His Pro Ile Gln Gln Val Phe Gln Gln

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Leu Gly Gln Pro Ser Val Ile Gln Thr Ser Val Pro Gln Leu Asn Pro

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tgg tct ctt caa gca act act gaa aaa tca cag aga att gaa acc gtg 2805

Trp Ser Leu Gln Ala Thr Thr Glu Lys Ser Gln Arg Ile Glu Thr Val

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Leu Gln Gln Pro Ala Ile Leu Pro Ser Gly Pro Val Asp Arg Lys His

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Leu Glu Asn Ala Thr Ser Asp Ile Leu Val Ser Pro Gly Asn Glu His

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aaa atc gtg cct gaa gct ttg ttg tgt cat cag gaa agt tct cac tat 2949

Lys Ile Val Pro Glu Ala Leu Leu Cys His Gln Glu Ser Ser His Tyr

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His Val Thr Asp Ile Gln Leu His Ile Leu Lys Asn Arg Met Tyr Gly

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Pro Val Ser Glu Lys Asp Ser Asn Ser Gln Val Asp Leu Ser Ile Arg

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aat gaa ttt cta ggg aat att gac ggg gga gat ctg aag gta cct gaa 3381

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Ser Gly Asp Asp Val Ser Glu Gln Asp Val Pro Asp Leu Phe Asp Thr

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Lys Trp Lys Phe Tyr Leu Lys Asp Gly Val Met Cys Phe Gly Gly Arg

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Glu Phe Pro Ser Gly Ser Ser Ser Thr Ser Ser Thr Pro Leu Ser Ser

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Pro Ile Val Asp Phe Tyr Phe Ser Pro Gly Pro Pro Ser Asn Ser Pro

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Leu Ser Thr Pro Thr Lys Asp Phe Pro Gly Phe Pro Gly Ile Pro Lys

85

90

95

Ala Gly Thr His Val Leu Tyr Pro Ile Pro Glu Ser Ser Ser Asp Ser

100

105

110

Pro Leu Ala Ile Ser Gly Gly Glu Ser Ser Leu Leu Pro Thr Arg Pro

115

120

125

Thr Cys Leu Ser His Ala Leu Leu Pro Ser Asp His Ser Cys Thr His

130

135

140

Pro Thr Pro Lys Val Gly Leu Pro Asp Glu Val Asn Pro Gln Gln Ala

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155

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Glu Ser Leu Gly Phe Gln Ser Asp Asp Leu Pro Gln Phe Gln Tyr Phe

165

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175

Asp Ser His Phe Thr Leu Asp Pro Pro Gly Ser Lys Lys Met Phe Ser

195

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Ser Arg Asn Lys Glu Met Pro Ile Asp Gln Lys Ser Leu Asn Lys Cys

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Ser Leu Asn Tyr Ile Cys Glu Lys Leu Glu His Leu Gln Ser Ala Glu

225

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235

240

Asn Gln Asp Ser Leu Arg Ser Leu Ser Met His Cys Leu Cys Ala Glu

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Glu Asn Ala Ser Ser Phe Val Pro His Thr Leu Phe Arg Ser Gln Pro

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Lys Ser Gly Trp Ser Phe Met Leu Arg Ile Pro Glu Lys Lys Asn Met

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Met Ser Ser Arg Gln Trp Gly Pro Ile Phe Leu Lys Val Leu Pro Gly

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Gly Ile Leu Gln Met Tyr Tyr Glu Gln Gly Leu Glu Lys Pro Phe Lys

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Glu Ile Gln Leu Asp Pro Tyr Cys Arg Leu Ser Glu Pro Lys Val Glu

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Asn Phe Ser Val Ala Gly Lys Ile His Thr Val Lys Ile Glu His Val

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Ser Tyr Thr Glu Lys Arg Lys Tyr His Ser Lys Thr Glu Val Val His

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Asp Phe Leu Asp Phe Leu Thr Thr Val Glu Glu Glu Leu Met Lys Leu
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Pro Ala Val Ser Lys Pro Lys Lys Asn Tyr Glu Glu Gln Glu Ile Ser
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Leu Glu Ile Val Asp Asn Phe Trp Gly Lys Val Thr Lys Glu Gly Lys
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Phe Val Glu Ser Ala Val Ile Thr Gln Ile Tyr Cys Leu Cys Phe Val
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Asn Gly Asn Leu Glu Cys Phe Leu Thr Leu Asn Asp Leu Glu Leu Pro
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Lys Arg Asp Glu Ser Tyr Tyr Glu Lys Asp Ser Glu Lys Lys Gly Ile
465 470 475 480

Asp Ile Leu Asp Tyr His Phe His Lys Cys Val Asn Val Gln Glu Phe
485 490 495

Glu Gln Ser Arg Ile Ile Lys Phe Val Pro Leu Asp Ala Cys Arg Phe
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Glu Leu Met Arg Phe Lys Thr Leu Tyr Asn Gly Asp Asn Leu Pro Phe
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Ser Leu Lys Ser Val Val Val Val Gln Gly Ala Tyr Val Glu Leu Gln
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Ser Leu Arg Ser Cys Asp Asn Ile Arg Ile His Phe Pro Val Pro Ser

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570

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Gln Trp Ile Lys Ala Leu Trp Thr Met Asn Leu Gln Arg Gln Lys Ser

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Leu Lys Ala Lys Met Asn Arg Arg Ala Cys Leu Gly Ser Leu Gln Glu

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Leu Glu Ser Glu Pro Val Ile Gln Val Thr Val Gly Ser Ala Lys Tyr

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Glu Ser Ala Tyr Gln Ala Val Val Trp Lys Ile Asp Arg Leu Pro Asp

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630

635

640

Lys Asn Ser Ser Leu Asp His Pro His Cys Leu Ser Tyr Lys Leu Glu

645

650

655

Leu Gly Ser Asp Gln Glu Ile Pro Ser Asp Trp Tyr Pro Phe Ala Thr

660

665

670

Val Gln Phe Ser Val Pro Asp Thr Cys Ala Ser Arg Thr Glu Val Arg

675

680

685

Ser Leu Gly Val Glu Ser Asp Val Gln Pro Gln Lys His Val Gln Gln

690

695

700

Arg Ala Cys Tyr Asn Ile Gln Pro Lys Leu Tyr Arg Ser Val Ile Glu

705

710

715

720

Glu Gln Val Leu Lys Asp Leu Lys Gln Leu Trp Glu Thr Lys Val Leu

740

745

750

Gln Ser Lys Ala Thr Glu Asp Phe Phe Arg Asn Ser Ile Gln Ser Pro

755

760

765

Leu Phe Thr Leu Gln Leu Pro His Ser Leu His Gln Thr Leu Gln Ser

770

775

780

Ser Thr Ala Ser Leu Val Ile Pro Ala Gly Arg Thr Leu Pro Ser Phe

785

790

795

800

Thr Thr Ala Glu Leu Gly Thr Ser Asn Ser Ser Ala Asn Phe Thr Phe

805

810

815

Pro Gly Tyr Pro Ile His Val Pro Ala Gly Val Thr Leu Gln Thr Val

820

825

830

Ser Gly His Leu Tyr Lys Val Asn Val Pro Ile Met Val Thr Glu Thr

835

840

845

Ser Gly Arg Ala Gly Ile Leu Gln His Pro Ile Gln Gln Val Phe Gln

850

855

860

Gln Leu Gly Gln Pro Ser Val Ile Gln Thr Ser Val Pro Gln Leu Asn

865

870

875

880

Pro Trp Ser Leu Gln Ala Thr Thr Glu Lys Ser Gln Arg Ile Glu Thr

885

890

895

Val Leu Gln Gln Pro Ala Ile Leu Pro Ser Gly Pro Val Asp Arg Lys

915

920

925

His Lys Ile Val Pro Glu Ala Leu Leu Cys His Gln Glu Ser Ser His
930 935 940

Tyr Ile Ser Leu Pro Gly Val Val Phe Ser Pro Gln Val Ser Gln Thr
945 950 955 960

Asn Ser Asp Val Glu Ser Val Leu Ser Gly Ser Ala Ser Met Ala Gln
965 970 975

Asn Leu His Asp Glu Ser Leu Ser Thr Ser Pro His Gly Ala Leu His
980 985 990

Gln His Val Thr Asp Ile Gln Leu His Ile Leu Lys Asn Arg Met Tyr
995 1000 1005

Gly Cys Asp Ser Val Lys Gln Pro Arg Asn Ile Glu Glu Pro Ser Asn
1010 1015 1020

Ile Pro Val Ser Glu Lys Asp Ser Asn Ser Gln Val Asp Leu Ser Ile
1025 1030 1035 1040

Arg Val Thr Asp Asp Asp Ile Gly Glu Ile Ile Gln Val Asp Gly Ser
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Gly Asp Thr Ser Ser Asn Glu Glu Ile Gly Ser Thr Arg Asp Ala Asp
1060 1065 1070

Glu Asn Glu Phe Leu Gly Asn Ile Asp Gly Gly Asp Leu Lys Val Pro
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Ser Asp Asn Glu Asp Pro Gln Val Asn Ile Val Glu Glu Asp Pro Leu
105 1110 1115 1120

Asn Ser Gly Asp Asp Val Ser Glu Gln Asp Val Pro Asp Leu Phe Asp
1125 1130 1135

Thr Asp Asn Val Ile Val Cys Gln Tyr Asp Lys Ile His Arg Ser Lys
1140 1145 1150

Asn Lys Trp Lys Phe Tyr Leu Lys Asp Gly Val Met Cys Phe Gly Gly
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Arg Asp Tyr Val Phe Ala Lys Ala Ile Gly Asp Ala Glu Trp
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Ala Phe Pro Arg Arg Thr Ser Phe Asn Thr

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tctgcactgc caaaccaata aatttacaga agagaaagct gtattccact gtacccttg 230

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223 Description of Artificial Sequence:oligonucleotide

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Met His His His His His His Val

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29